

AUDIO SYSTEMS

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DESCRIPTION AND OPERATION

AUDIO SYSTEM

DESCRIPTION

An audio system is standard factory-installed equipment on this model, unless the vehicle is ordered with an available radio delete option. The standard equipment audio system includes an AM/FM/cassette (RAS sales code) receiver, and speakers in four locations. Several combinations of radio receivers and speaker systems are offered as optional equipment on this model. The audio system uses an ignition switched source of battery current so that the system will only operate when the ignition switch is in the On or Accessory positions. The audio system includes the following components:

- Antenna
- Clockspring (with remote radio switches only)
- High-line Central Timer Module (CTM) (with remote radio switches)
 - Power amplifier (with premium speaker system only)
 - Radio noise suppression components
 - Radio receiver
 - Remote radio switches (optional with RAZ radio receiver only)
 - Speakers

Refer to **Clockspring** in the Description and Operation section of Group 8M - Passive Restraint Systems for more information on this component. Refer to **Central Timer Module** in the Description and

Operation section of Group 8E - Instrument Panel Systems for more information on this component. Refer to **Audio System** in the Contents of Group 8W - Wiring Diagrams for complete circuit diagrams. Following are general descriptions of the remaining major components in the standard and optional factory-installed audio systems.

OPERATION

See the owner's manual in the vehicle glove box for more information on the features, use and operation of each of the available audio systems.

CENTRAL TIMER MODULE

The high-line Central Timer Module (CTM) can also control some features of the audio system when the vehicle is equipped with the optional RAZ radio receiver and remote radio switches. A high-line CTM is used on high-line versions of this vehicle. The CTM combines the functions of a chime/buzzer module, an intermittent wipe module, an illuminated entry module, a remote keyless entry module, and a vehicle theft security system module in a single unit.

The high-line CTM also controls and integrates many of the additional electronic functions and features included on models with this option. The RAZ radio receiver with a remote radio switch option is one of the features that the CTM controls. The CTM is programmed to send switch status messages over the Chrysler Collision Detection (CCD) data bus to control the volume, seek, and pre-set station advance functions of the RAZ radio receiver. The CTM monitors the status of the remote radio switches located

DESCRIPTION AND OPERATION (Continued)

on the steering wheel through a hard wired circuit. The CTM then sends the proper switch status messages to the radio receiver. The electronic circuitry within the radio receiver responds to the switch status messages it receives by adjusting the radio settings as requested.

Refer to **Central Timer Module** in the Description and Operation section of Group 8E - Instrument Panel Systems for more information on the high-line CTM. Refer to **Remote Radio Switch** in the Description and Operation section of this group for more information on this component. In addition, radio receivers connected to the CCD data bus have several audio system functions that can be diagnosed using a DRB scan tool. Refer to the proper Diagnostic Procedures manual for more information on DRB testing of the audio systems.

RADIO RECEIVER

DESCRIPTION

Available factory-installed radio receivers for this model include an AM/FM/cassette (RAS sales code), an AM/FM/cassette/5-band graphic equalizer with CD changer control feature (RBN sales code), an AM/FM/CD/3-band graphic equalizer (RBR sales code), or an AM/FM/CD/cassette/3-band graphic equalizer (RAZ sales code). The factory-installed RAZ sales code radio receivers can also communicate on the Chrysler Collision Detection (CCD) data bus network through a separate two-way wire harness connector. All factory-installed receivers are stereo Electronically Tuned Radios (ETR) and include an electronic digital clock function.

These radio receivers can only be serviced by an authorized radio repair station. See the latest Warranty Policies and Procedures manual for a current listing of authorized radio repair stations.

IGNITION-OFF DRAW FUSE

All vehicles are equipped with an Ignition-Off Draw (IOD) fuse that is removed when the vehicle is shipped from the factory. This fuse feeds various accessories that require battery current when the ignition switch is in the Off position, including the clock. The IOD fuse is removed to prevent battery discharge during vehicle storage.

When removing or installing the IOD fuse, it is important that the ignition switch be in the Off position. Failure to place the ignition switch in the Off position can cause the radio display to become scrambled when the IOD fuse is removed and replaced. Removing and replacing the IOD fuse again, with the ignition switch in the Off position, will correct the scrambled display condition.

The IOD fuse should be checked if the radio or clock displays are inoperative. The IOD fuse is located in the junction block. Refer to the fuse layout label on the back of the instrument panel fuse access panel for IOD fuse identification and location.

OPERATION

The radio receiver operates on fused battery current that is available only when the ignition switch is in the On or Accessory positions. The electronic digital clock function of the radio operates on fused battery current supplied through the IOD fuse, regardless of the ignition switch position.

For more information on the features, setting procedures, and control functions for each of the available factory-installed radio receivers, see the owner's manual in the vehicle glove box. For complete circuit diagrams, refer to **Audio System** in the Contents of Group 8W - Wiring Diagrams.

REMOTE RADIO SWITCH

DESCRIPTION

A remote radio switch option is available on models equipped with the AM/FM/CD/cassette/3-band graphic equalizer (RAZ sales code) radio receiver and the high-line Central Timer Module (CTM). Refer to **Central Timer Module** in the Description and Operation section of Group 8E - Instrument Panel Systems for more information on this component.

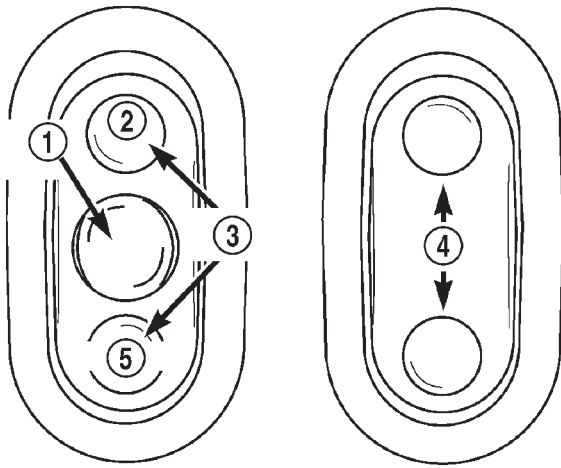
Two rocker-type switches (Fig. 1) are mounted in the sides of the rear (instrument panel side) steering wheel trim cover. The switch on the left side is the seek switch and has seek up, seek down, and preset station advance functions. The switch on the right side is the volume control switch and has volume up, and volume down functions. The two switches are retained in mounting holes located on each side of the rear steering wheel trim cover by four latches that are integral to the switches.

The remote radio switches share a common steering wheel wire harness with the vehicle speed control switches. The steering wheel wire harness is connected to the instrument panel wire harness through the clockspring. Refer to **Clockspring** in the Description and Operation section of Group 8M - Passive Restraint Systems for more information on this component.

OPERATION

The remote radio switches are resistor multiplexed units that are hard wired to the high-line CTM through the clockspring. The CTM monitors the status of the remote radio switches and sends the proper switch status messages on the Chrysler Collision Detection (CCD) data bus network to the radio

DESCRIPTION AND OPERATION (Continued)



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Fig. 1 Remote Radio Switches

- 1 - PRESET SEEK
- 2 - UP
- 3 - SEEK
- 4 - VOLUME
- 5 - DOWN

receiver. The electronic circuitry within the radio is programmed to respond to these remote radio switch status messages by adjusting the radio settings as requested.

For diagnosis of the CTM or the CCD data bus, the use of a DRB scan tool and the proper Diagnostic Procedures manual are recommended. For more information on the features and control functions for each of the remote radio switches, see the owner's manual in the vehicle glove box. For complete circuit diagrams, refer to **Audio System** in the Contents of Group 8W - Wiring Diagrams.

SPEAKER SYSTEM**DESCRIPTION****STANDARD**

The standard equipment speaker system includes speakers in four locations. One full-range 16.5 centimeter (6.50 inch) diameter speaker is located in each front door. There is also one full-range speaker located in each rear cab side panel, 13.3 centimeter (5.25 inch) diameter units for the standard cab models, and 16.5 centimeter (6.50 inch) diameter units for the club cab models. On quad cab models, the 16.5 centimeter (6.50 inch) diameter full-range speaker units are located in each rear door, instead of in the cab side panel.

PREMIUM

The optional premium speaker system features Infinity model speakers in six locations. Each of the standard speakers in the four speaker stereo system are replaced with Infinity model speakers, and an additional 6.9 centimeter (2.75 inch) diameter Infinity dome tweeter is mounted high in the front door trim panels. The premium speaker system also includes an additional Infinity power amplifier. The total available power of the premium speaker system is about 100 watts.

OPERATION**STANDARD**

Each of the four full-range speakers used in the standard speaker system is driven by the amplifier that is integral to the factory-installed radio receiver. For complete circuit diagrams, refer to **Audio System** in the Contents of Group 8W - Wiring Diagrams.

PREMIUM

The six Infinity speakers used in the premium speaker system are all driven by the radio receiver through an Infinity power amplifier. For complete circuit diagrams, refer to **Audio System** in the Contents of Group 8W - Wiring Diagrams.

POWER AMPLIFIER**DESCRIPTION**

Models equipped with the Infinity premium speaker package have a separate power amplifier unit. This power amplifier is rated at 100 watts output. The power amplifier unit is mounted to the right cowl side inner panel under the passenger side end of the instrument panel. The power amplifier unit can be accessed for service by removing the trim from the right cowl side inner panel.

The power amplifier unit should be checked if there is no sound output noted from the speakers. For diagnosis of the power amplifier, refer to **Speaker** in the Diagnosis and Testing section of this group. The power amplifier cannot be repaired or adjusted and, if faulty or damaged, the unit must be replaced.

OPERATION

The power amplifier receives fused battery current from a fuse in the Junction Block (JB) at all times. The internal circuitry of the power amplifier switches the amplifier on based upon a fused 12 volt output signal that is received from the radio receiver whenever the radio is turned on. The power amplifier receives the sound signal inputs for four speaker channels from the radio receiver, then sends the

DESCRIPTION AND OPERATION (Continued)

amplified speaker outputs for each of those channels to the six speakers. For complete circuit diagrams, refer to **Audio System** in the Contents of Group 8W - Wiring Diagrams.

ANTENNA

DESCRIPTION

All models use a black painted fixed-length stainless steel rod-type antenna mast, installed on the right front fender of the vehicle. The antenna mast has a spiral groove cut down its length to reduce wind noise. The antenna mast is connected to the center wire of the coaxial antenna cable, and is not grounded to any part of the vehicle. To eliminate static, the antenna base must have a good ground. The coaxial antenna cable shield (the outer wire mesh of the cable) is grounded to the antenna base and the radio receiver chassis.

The antenna coaxial cable has an additional disconnect, located near the inboard side of the glove box opening on the back side of the lower instrument panel reinforcement. This additional disconnect allows the instrument panel assembly to be removed and installed without removing the radio receiver.

The factory-installed Electronically Tuned Radios (ETR) automatically compensate for radio antenna trim. Therefore, no antenna trimmer adjustment is required or possible when replacing the radio receiver or the antenna.

RADIO NOISE SUPPRESSION

DESCRIPTION

Radio Frequency Interference (RFI) and Electro-Magnetic Interference (EMI) noise suppression is

accomplished primarily through circuitry internal to the radio receivers. These internal suppression devices are only serviced as part of the radio receiver.

External suppression devices that are used on this vehicle to control RFI or EMI noise include the following:

- Radio antenna base ground
- Radio receiver chassis ground wire or strap
- Engine-to-body ground strap(s)
- Exhaust system-to-body ground strap (4.7L engines only)
- Resistor-type spark plugs
- Radio suppression-type secondary ignition wiring.

For more information on the spark plugs and secondary ignition components, refer to **Ignition System** in the Description and Operation section of Group 8D - Ignition System.

DIAGNOSIS AND TESTING

AUDIO SYSTEM

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

Audio System Diagnosis		
CONDITION	POSSIBLE CAUSE	CORRECTION
NO AUDIO	<ol style="list-style-type: none"> 1. Fuse faulty. 2. Radio connector faulty. 3. Wiring faulty. 4. Ground faulty. 5. Radio faulty. 6. Speakers faulty. 7. Amplifier faulty (if equipped). 	<ol style="list-style-type: none"> 1. Check radio fuses in junction block. Replace faulty fuses, if required. 2. Check for loose or corroded radio connections. Repair, if required. 3. Check for battery voltage at radio connector. Repair wiring, if required. 4. Check for continuity between radio chassis and a known good ground. There should be continuity. Repair ground, if required. 5. Refer to Radio in the Diagnosis and Testing section of this group. 6. Refer to Speaker in the Diagnosis and Testing section of this group. 7. Refer to Speaker in the Diagnosis and Testing section of this group.

DIAGNOSIS AND TESTING (Continued)

Audio System Diagnosis		
CONDITION	POSSIBLE CAUSE	CORRECTION
NO DISPLAY	<ol style="list-style-type: none"> 1. Fuse faulty. 2. Radio connector faulty. 3. Wiring faulty. 4. Ground faulty. 5. Radio faulty. 	<ol style="list-style-type: none"> 1. Check radio fuses in junction block. Replace faulty fuses, if required. 2. Check for loose or corroded radio connections. Repair, if required. 3. Check for battery voltage at radio connector. Repair wiring, if required. 4. Check for continuity between radio chassis and a known good ground. There should be continuity. Repair ground, if required. 5. Refer to Radio in the Diagnosis and Testing section of this group.
CLOCK WILL NOT KEEP SET TIME	<ol style="list-style-type: none"> 1. Fuse faulty. 2. Radio connector faulty. 3. Wiring faulty. 4. Ground faulty. 5. Radio faulty. 	<ol style="list-style-type: none"> 1. Check ignition-off draw fuse. Replace faulty fuse, if required. 2. Check for loose or corroded radio connections. Repair, if required. 3. Check for battery voltage at radio connector. Repair wiring, if required. 4. Check for continuity between radio chassis and a known good ground. There should be continuity. Repair ground, if required. 5. Refer to Radio in the Diagnosis and Testing section of this group.
POOR RADIO RECEPTION	<ol style="list-style-type: none"> 1. Antenna faulty. 2. Ground faulty. 3. Radio faulty. 4. Faulty EMI or RFI noise suppression. 	<ol style="list-style-type: none"> 1. Refer to Antenna in the Diagnosis and Testing section of this group. 2. Check for continuity between radio chassis and a known good ground. There should be continuity. Repair ground, if required. 3. Refer to Radio in the Diagnosis and Testing section of this group. 4. Refer to Radio Frequency Interference in the Diagnosis and Testing section of this group.
NO/POOR TAPE OPERATION	<ol style="list-style-type: none"> 1. Faulty tape. 2. Foreign objects behind tape door. 3. Dirty cassette tape head. 4. Faulty tape deck. 	<ol style="list-style-type: none"> 1. Insert known good tape and test operation. 2. Remove foreign objects and test operation. 3. Clean head with Mopar Cassette Head Cleaner. 4. Exchange or replace radio, if required.
NO COMPACT DISC OPERATION	<ol style="list-style-type: none"> 1. Faulty CD. 2. Foreign material on CD. 3. Condensation on CD or optics. 4. Faulty CD player. 	<ol style="list-style-type: none"> 1. Insert known good CD and test operation. 2. Clean CD and test operation. 3. Allow temperature of vehicle interior to stabilize and test operation. 4. Exchange or replace radio, if required.

RADIO RECEIVER

If the vehicle is equipped with the optional remote radio switches located on the steering wheel and the problem being diagnosed is related to one of the symptoms listed below, be certain to check the remote radio switches and circuits. Refer to **Remote Radio Switch** in the Diagnosis and Testing section

of this group prior to attempting radio diagnosis or repair.

- Stations changing with no remote radio switch input
- Radio memory presets not working properly
- Volume changes with no remote radio switch input

DIAGNOSIS AND TESTING (Continued)

- Remote radio switch buttons taking on other functions
- CD player skipping tracks
- Remote radio switch inoperative.

For complete circuit diagrams, refer to **Audio System** in the Contents of Group 8W - Wiring Diagrams.

WARNING: ON VEHICLES EQUIPPED WITH AIR-BAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIR-BAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

CAUTION: The speaker output of the radio receiver is a "floating ground" system. Do not allow any speaker lead to short to ground, as damage to the radio receiver may result.

(1) Check the fused B(+) fuse in the junction block. If OK, go to Step 2. If not OK, repair the shorted circuit or component as required and replace the faulty fuse.

(2) Check for battery voltage at the fused B(+) fuse in the junction block. If OK, go to Step 3. If not OK, repair the open fused B(+) circuit to the Power Distribution Center (PDC) as required.

(3) Check the fused ignition switch output (acc/run) fuse in the junction block. If OK, go to Step 4. If not OK, repair the shorted circuit or component as required and replace the faulty fuse(s).

(4) Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (acc/run) fuse in the junction block. If OK, go to Step 5. If not OK, repair the open fused ignition switch output (acc/run) circuit to the ignition switch as required.

(5) Turn the ignition switch to the Off position. Disconnect and isolate the battery negative cable. Remove the radio receiver from the instrument panel, but do not disconnect the wire harness connectors. Check for continuity between the radio receiver chassis and a good ground. There should be continuity. If OK, go to Step 6. If not OK, repair the open ground circuit to ground as required.

(6) Connect the battery negative cable. Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (acc/run) circuit cavity of the left (gray) radio wire harness connector. If OK, go to Step 7. If not OK, repair the open fused ignition switch output (acc/run) circuit to the junction block fuse as required.

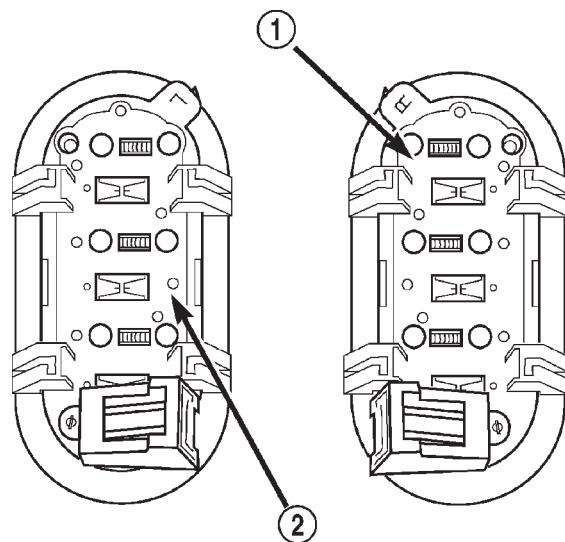
(7) Turn the ignition switch to the Off position. Check for battery voltage at the fused B(+) circuit cavity of the left (gray) radio wire harness connector. If OK, replace the faulty radio receiver. If not OK, repair the open fused B(+) circuit to the junction block fuse as required.

REMOTE RADIO SWITCH

For complete circuit diagrams, refer to **Audio System** in the Contents of Group 8W - Wiring Diagrams.

WARNING: ON VEHICLES EQUIPPED WITH AIR-BAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIR-BAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

(1) Remove the remote radio switch(es) (Fig. 2) from the steering wheel.



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Fig. 2 Remote Radio Switches

- 1 - WHITE REAR SWITCH
2 - BLACK REAR SWITCH

(2) Use an ohmmeter to check the switch resistances as shown in the Remote Radio Switch Test chart. If the remote radio switch resistances check OK, go to Step 3. If not OK, replace the faulty switch.

(3) Check for continuity between the ground circuit cavity of the remote radio switch wire harness connector and a good ground. There should be continuity. If OK, go to Step 4. If not OK, repair the open ground circuit to ground as required.

DIAGNOSIS AND TESTING (Continued)

REMOTE RADIO SWITCH TEST		
SWITCH	SWITCH POSITION	RESISTANCE
Right (White)	Volume Up	7320 Ohms
Right (White)	Volume Down	1210 Ohms
Left (Black)	Seek Up	4530 Ohms
Left (Black)	Seek Down	2050 Ohms
Left (Black)	Pre-Set Station Advance	10 Ohms

(4) Disconnect the 18-way wire harness connector from the Central Timer Module (CTM). Check for continuity between the radio control mux circuit cavity of the remote radio switch wire harness connector and a good ground. There should be no continuity. If OK, go to Step 5. If not OK, repair the shorted radio control mux circuit as required.

(5) Check for continuity between the radio control mux circuit cavities of the remote radio switch wire harness connector and the 18-way CTM wire harness connector. There should be continuity. If OK, refer to the proper Diagnostic Procedures manual to test the CTM and the Chrysler Collision Detection (CCD) data bus. If not OK, repair the open radio control mux circuit as required.

SPEAKER

For complete circuit diagrams, refer to **Audio System** in the Contents of Group 8W - Wiring Diagrams.

WARNING: ON VEHICLES EQUIPPED WITH AIR-BAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIR-BAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

CAUTION: The speaker output of the radio is a "floating ground" system. Do not allow any speaker lead to short to ground, as damage to the radio may result.

(1) Turn the ignition switch to the On position. Turn the radio receiver on. Adjust the balance and fader controls to check the performance of each individual speaker. Note the speaker locations that are not performing correctly. Go to Step 2.

(2) Turn the radio receiver off. Turn the ignition switch to the Off position. Disconnect and isolate the battery negative cable. Remove the radio receiver from the instrument panel. If the vehicle is equipped with the Infinity speaker package, also disconnect the wire harness connectors at the power amplifier. Check both the speaker feed (+) circuit and return (-) circuit cavities for the inoperative speaker location(s) at the radio receiver wire harness connectors for continuity to ground. In each case, there should be no continuity. If OK, go to Step 3. If not OK, repair the shorted speaker feed (+) and/or return (-) circuit(s) to the speaker as required.

(3) If the vehicle is equipped with the Infinity speaker package, go to Step 6. If the vehicle is equipped with the standard speaker system, check the resistance between the speaker feed (+) circuit and return (-) circuit cavities of the radio receiver wire harness connectors for the inoperative speaker location(s). The meter should read between 2 and 28 ohms (speaker resistance). If OK, go to Step 4. If not OK, go to Step 5.

(4) Install a known good radio receiver. Connect the battery negative cable. Turn the ignition switch to the On position. Turn on the radio receiver and test the speaker operation. If OK, replace the faulty radio receiver. If not OK, turn the radio receiver off, turn the ignition switch to the Off position, disconnect and isolate the battery negative cable, remove the test radio receiver, and go to Step 5.

(5) Disconnect the wire harness connector at the inoperative speaker. Check for continuity between the speaker feed (+) circuit cavities of the radio receiver wire harness connector and the speaker wire harness connector. Repeat the check between the speaker return (-) circuit cavities of the radio receiver wire harness connector and the speaker wire harness connector. In each case, there should be continuity. If OK, replace the faulty speaker. If not OK, repair the open speaker feed (+) and/or return (-) circuit(s) as required.

(6) For each inoperative speaker location, check for continuity between the speaker feed (+) circuit cavities of the radio receiver wire harness connectors and the power amplifier wire harness connectors. Repeat the check for each inoperative speaker location between the speaker return (-) circuit cavities of the radio receiver wire harness connectors and the power amplifier wire harness connectors. In each case, there should be continuity. If OK, go to Step 7. If not OK, repair the open speaker feed (+) and/or return (-) circuit(s) as required.

(7) Check for continuity between the two ground circuit cavities of the power amplifier wire harness connector and a good ground. There should be conti-

DIAGNOSIS AND TESTING (Continued)

nuity. If OK, go to Step 8. If not OK, repair the open ground circuit(s) to ground as required.

(8) Check the power amplifier fuse in the junction block. If OK, go to Step 9. If not OK, repair the shorted circuit or component as required and replace the faulty fuse.

(9) Install the radio receiver. Connect the battery negative cable. Check for battery voltage at the power amplifier fuse in the junction block. If OK, go to Step 10. If not OK, repair the open fused B(+) circuit to the PDC as required.

(10) Check for battery voltage at the two fused B(+) circuit cavities of the power amplifier wire harness connector. If OK, go to Step 11. If not OK, repair the open fused B(+) circuit(s) to the fuse in the junction block as required.

(11) Turn the ignition switch to the On position. Turn the radio receiver on. Check for battery voltage at the radio 12 volt output circuit cavity of the power amplifier wire harness connector. If OK, go to Step 12. If not OK, repair the open radio 12 volt output circuit to the radio receiver as required.

(12) Turn the radio receiver off. Turn the ignition switch to the Off position. Disconnect and isolate the battery negative cable. For each inoperative speaker location, check both the amplified feed (+) circuit and the amplified return (-) circuit cavities of the power amplifier wire harness connectors for continuity to ground. In each case there should be no continuity. If OK, go to Step 13. If not OK, repair the shorted amplified feed (+) and/or amplified return (-) circuit(s) to the speaker as required.

(13) For each inoperative speaker location, check the resistance between the amplified feed (+) circuit and the amplified return (-) circuit cavities of the power amplifier wire harness connectors. The meter should read between 2 and 28 ohms (speaker resistance). If OK, replace the faulty power amplifier. If not OK, go to Step 14.

(14) Disconnect the speaker wire harness connector at the inoperative speaker. Check for continuity between the amplified feed (+) circuit cavities of the speaker wire harness connector and the power amplifier wire harness connector. Repeat the check between the amplified return (-) circuit cavities of the speaker wire harness connector and the power amplifier wire harness connector. In each case there should be continuity. If OK, replace the faulty speaker. If not OK, repair the open amplified feed (+) and/or amplified return (-) circuit(s) as required.

POWER AMPLIFIER

The power amplifier unit should be checked if there is no sound output noted from the speakers. For diagnosis of the power amplifier, refer to **Speaker** in the Diagnosis and Testing section of this

group. For complete circuit diagrams, refer to **Audio System** in the Contents of Group 8W - Wiring Diagrams.

ANTENNA

WARNING: ON VEHICLES EQUIPPED WITH AIR-BAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIR-BAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

The following four tests are used to diagnose the antenna with an ohmmeter:

- **Test 1** - Mast to ground test
- **Test 2** - Tip-of-mast to tip-of-conductor test
- **Test 3** - Body ground to battery ground test
- **Test 4** - Body ground to coaxial shield test.

The ohmmeter test lead connections for each test are shown in Antenna Tests (Fig. 3).

NOTE: This model has a special coating on the antenna mast which is not electrically conductive. Remove the antenna mast from the antenna base before attempting to perform Tests 1 and 2.

NOTE: This model has a two-piece antenna coaxial cable. Tests 2 and 4 must be conducted in two steps to isolate a coaxial cable problem; from the coaxial cable connection under the right end of the instrument panel near the inboard side of the glove box opening to the antenna base, and then from the coaxial cable connection to the radio chassis connection.

TEST 1

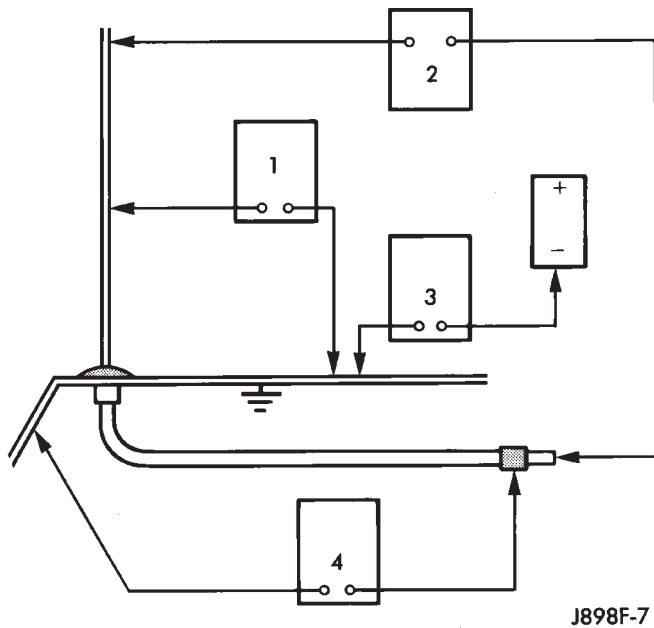
Test 1 determines if the antenna mast is insulated from the base. Proceed as follows:

(1) Disconnect the antenna coaxial cable connector from the radio receiver chassis and isolate. Remove the antenna mast from the antenna base.

(2) Insert one ohmmeter test lead into the socket for the antenna mast in the center of the antenna base. Connect the other test lead to the perimeter of the antenna base. Check for continuity.

(3) There should be no continuity. If continuity is found, replace the faulty or damaged antenna base and cable assembly.

DIAGNOSIS AND TESTING (Continued)

**Fig. 3 Antenna Tests****TEST 2**

Test 2 checks the antenna for an open circuit as follows:

(1) Disconnect the antenna coaxial cable connector from the radio receiver chassis. Remove the antenna mast from the antenna base.

(2) Insert one ohmmeter test lead into the socket for the antenna mast in the center of the antenna base. Connect the other test lead to the center pin of the antenna coaxial cable connector.

(3) Continuity should exist (the ohmmeter should only register a fraction of an ohm). High or infinite resistance indicates damage to the base and cable assembly. Replace the faulty base and cable, if required.

TEST 3

Test 3 checks the condition of the vehicle body ground connection. This test should be performed with the battery positive cable removed from the battery. Disconnect both battery cables, the negative cable first. Reconnect the battery negative cable and perform the test as follows:

(1) Connect one ohmmeter test lead to the vehicle fender. Connect the other test lead to the battery negative terminal post.

(2) The resistance should be less than one ohm.

(3) If the resistance is more than one ohm, check the braided ground strap(s) connected to the engine and the vehicle body for being loose, corroded, or damaged. Repair the ground strap connections, if required.

TEST 4

Test 4 checks the condition of the ground between the antenna base and the vehicle body as follows:

(1) Connect one ohmmeter test lead to the vehicle fender. Connect the other test lead to the outer crimp on the antenna coaxial cable connector.

(2) The resistance should be less than one ohm.

(3) If the resistance is more than one ohm, clean and/or tighten the antenna base to fender mounting hardware.

RADIO FREQUENCY INTERFERENCE

WARNING: ON VEHICLES EQUIPPED WITH AIR-BAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIR-BAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

For complete circuit diagrams, see Group 8W - Wiring Diagrams. Inspect the ground paths and connections at the following locations:

- Blower motor
- Electric fuel pump
- Engine-to-body ground strap(s)
- Generator
- Ignition module
- Radio antenna base ground
- Radio receiver chassis ground wire or strap
- Wiper motor.

If the source of RFI or EMI noise is identified as a component on the vehicle (i.e., generator, blower motor, etc.), the ground path for that component should be checked. If excessive resistance is found in any ground circuit, clean, tighten, or repair the ground circuits or connections to ground as required before considering any component replacement.

For service and inspection of secondary ignition components, refer to the Diagnosis and Testing section of Group 8D - Ignition Systems. Inspect the following secondary ignition system components:

- Distributor cap and rotor
- Ignition coil
- Spark plugs
- Spark plug wire routing and condition.

Reroute the spark plug wires or replace the faulty components as required.

If the source of the RFI or EMI noise is identified as two-way mobile radio or telephone equipment, check the equipment installation for the following:

DIAGNOSIS AND TESTING (Continued)

- Power connections should be made directly to the battery, and fused as closely to the battery as possible.

- The antenna should be mounted on the roof or toward the rear of the vehicle. Remember that magnetic antenna mounts on the roof panel can adversely affect the operation of an overhead console compass, if the vehicle is so equipped.

- The antenna cable should be fully shielded coaxial cable, should be as short as is practical, and should be routed away from the factory-installed vehicle wire harnesses whenever possible.

- The antenna and cable must be carefully matched to ensure a low Standing Wave Ratio (SWR).

Fleet vehicles are available with an extra-cost RFI-suppressed Powertrain Control Module (PCM). This unit reduces interference generated by the PCM on some radio frequencies used in two-way radio communications. However, this unit will not resolve complaints of RFI in the commercial AM or FM radio frequency ranges.

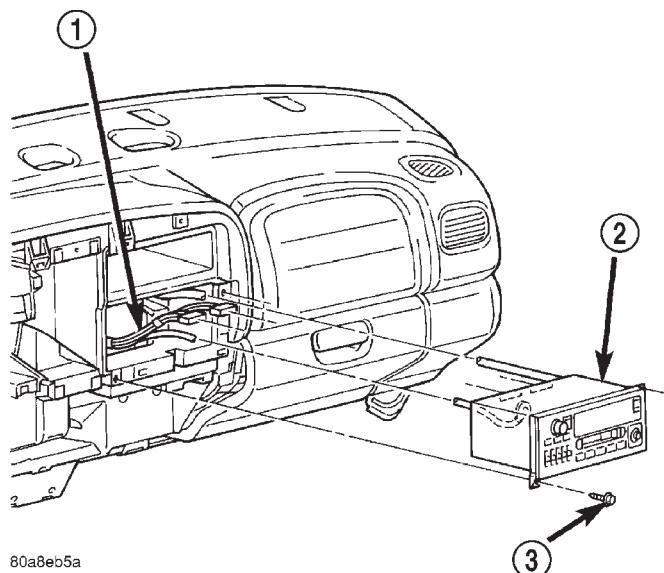


Fig. 4 Radio Receiver Remove/Install

- 1 - WIRE HARNESS
2 - RADIO
3 - SCREW

REMOVAL AND INSTALLATION

RADIO RECEIVER

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

REMOVAL

(1) Disconnect and isolate the battery negative cable.

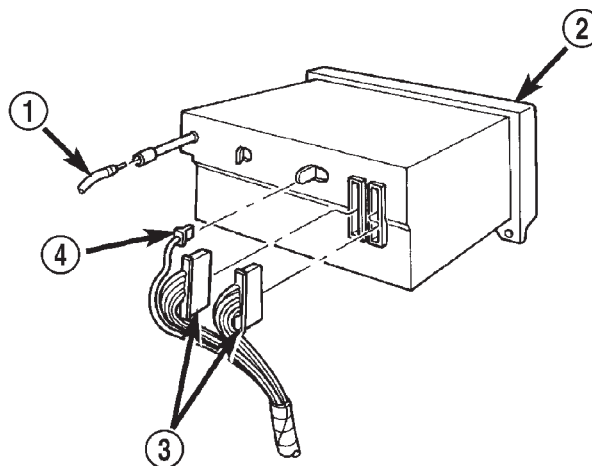
(2) Remove the cluster bezel from the instrument panel. Refer to **Cluster Bezel** in the Removal and Installation section of Group 8E - Instrument Panel Systems for the procedures.

(3) Remove the two screws that secure the radio receiver to the instrument panel (Fig. 4).

(4) Pull the radio receiver out from the instrument panel far enough to access the instrument panel wire harness connectors and the antenna coaxial cable connector (Fig. 5).

(5) Disconnect the instrument panel wire harness connectors and the antenna coaxial cable connector from the receptacles on the rear of the radio receiver.

(6) Remove the radio receiver from the instrument panel.



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Fig. 5 Radio Receiver Connections - Typical

- 1 - ANTENNA CABLE
2 - RADIO
3 - INSTRUMENT PANEL WIRING
4 - GROUND WIRE

INSTALLATION

(1) Position the radio receiver to the instrument panel.

(2) Reconnect the instrument panel wire harness connectors and the antenna coaxial cable connector to the receptacles on the rear of the radio receiver.

(3) Position the radio receiver into the mounting hole in the instrument panel.

REMOVAL AND INSTALLATION (Continued)

(4) Install and tighten the two screws that secure the radio receiver to the instrument panel. Tighten the screws to 5 N·m (45 in. lbs.).

(5) Install the cluster bezel onto the instrument panel. Refer to **Cluster Bezel** in the Removal and Installation section of Group 8E - Instrument Panel Systems for the procedures.

(6) Reconnect the battery negative cable.

REMOTE RADIO SWITCH

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Remove the driver side airbag module from the steering wheel. Refer to **Driver Side Airbag Module** in the Removal and Installation section of Group 8M - Passive Restraint Systems for the procedures.

(3) Remove the speed control switch located on the same side of the steering wheel as the remote radio switch that is being serviced. Refer to **Speed Control Switches** in the Removal and Installation section of Group 8H - Speed Control System for the procedures.

(4) Disconnect the steering wheel wire harness connector from the connector receptacle of the remote radio switch (Fig. 6).

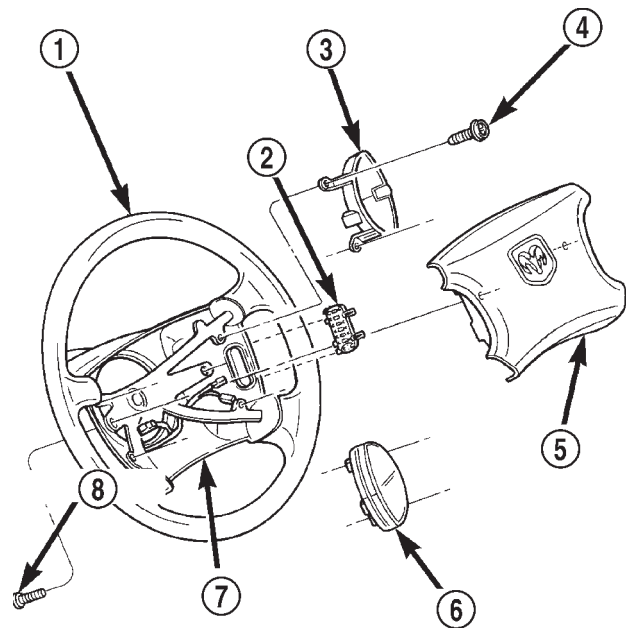
(5) Disengage the four remote radio switch latches that secure the switch to the inside of the mounting hole in the steering wheel rear trim cover.

(6) From the outside of the steering wheel rear trim cover, remove the remote radio switch from the trim cover mounting hole.

INSTALLATION

(1) Position the remote radio switch to the mounting hole on the outside of the steering wheel rear trim cover. Be certain that the connector receptacle is oriented toward the bottom of the switch and pointed toward the center of the steering wheel.

(2) Press firmly and evenly on the remote radio switch until each of the switch latches is fully engaged in the mounting hole of the steering wheel rear trim cover.



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Fig. 6 Remote Radio Switches Remove/Install

- 1 - STEERING WHEEL
- 2 - REMOTE RADIO SWITCH
- 3 - SPEED CONTROL SWITCH
- 4 - SCREW (2)
- 5 - DRIVER SIDE AIRBAG MODULE
- 6 - SPEED CONTROL SWITCH
- 7 - REAR TRIM COVER
- 8 - SCREW (2)

(3) Reconnect the steering wheel wire harness connector to the connector receptacle of the remote radio switch.

(4) Install the speed control switch onto the steering wheel. Refer to **Speed Control Switches** in the Removal and Installation section of Group 8H - Speed Control System for the procedures.

(5) Install the driver side airbag module onto the steering wheel. Refer to **Driver Side Airbag Module** in the Removal and Installation section of Group 8M - Passive Restraint Systems for the procedures.

(6) Reconnect the battery negative cable.

SPEAKER

REMOVAL

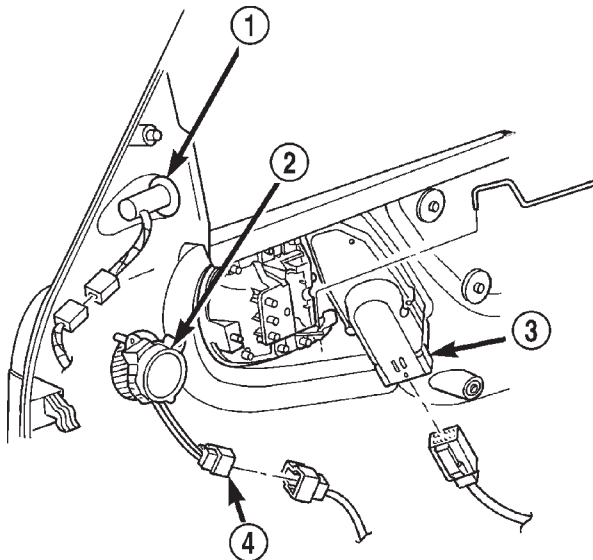
FRONT DOOR UPPER SPEAKER

(1) Disconnect and isolate the battery negative cable.

(2) Remove the trim panel from the front door. Refer to **Front Door Trim Panel** in the Removal and Installation section of Group 23 - Body for the procedures.

REMOVAL AND INSTALLATION (Continued)

(3) Disconnect the door wire harness connector from the front door upper speaker wire harness connector (Fig. 7).



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Fig. 7 Front Door Upper Speaker Remove/Install

- 1 - POWER MIRROR SWITCH
- 2 - TWEETER
- 3 - POWER WINDOW SWITCH
- 4 - WIRE HARNESS CONNECTOR

(4) Remove the two screws that secure the front door upper speaker to the back of the trim panel.

(5) Remove the front door upper speaker from the trim panel.

FRONT DOOR LOWER SPEAKER

(1) Disconnect and isolate the battery negative cable.

(2) Remove the trim panel from the front door. Refer to **Front Door Trim Panel** in the Removal and Installation section of Group 23 - Body for the procedures.

(3) Remove the three screws that secure the speaker to the front door inner panel (Fig. 8).

(4) Pull the speaker away from the mounting hole in the front door inner panel far enough to access the wire harness connector.

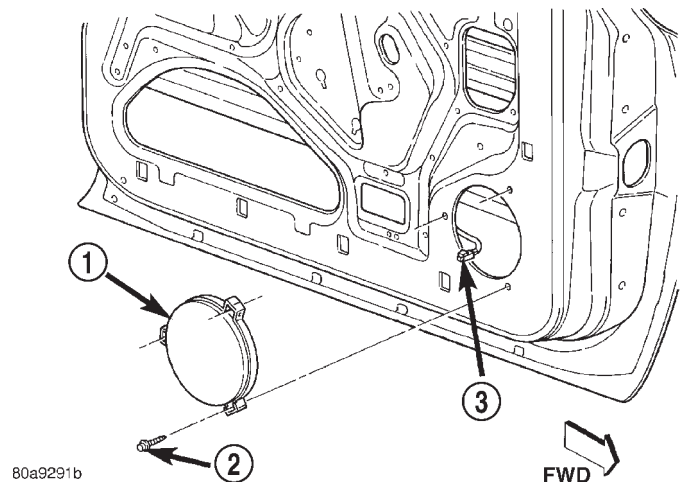
(5) Disconnect the front door wire harness connector from the speaker connector receptacle.

(6) Remove the speaker from the front door inner panel.

REAR CAB SIDE PANEL SPEAKER - STANDARD CAB

(1) Disconnect and isolate the battery negative cable.

(2) Remove the trim panel from the B-pillar. Refer to **B-Pillar Trim** in the Removal and Installation section of Group 23 - Body for the procedures.

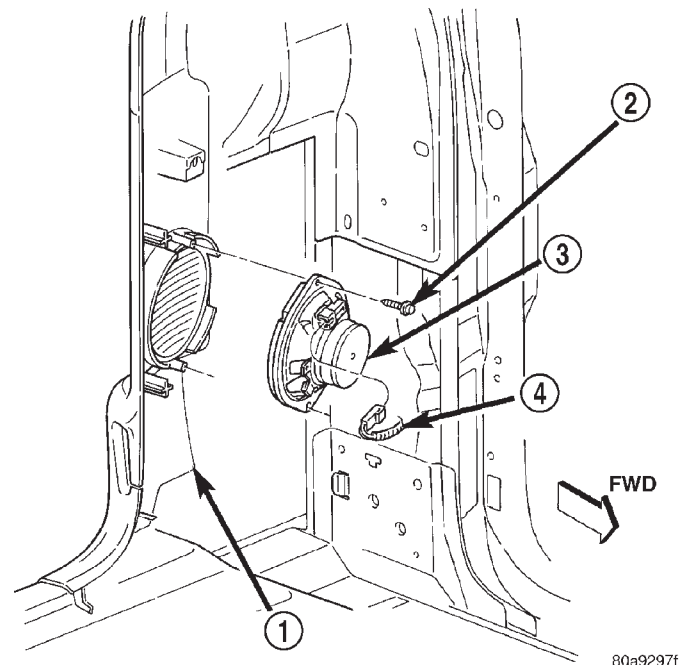


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Fig. 8 Front Door Lower Speaker Remove/Install

- 1 - SPEAKER
- 2 - SCREW
- 3 - CONNECTOR

(3) Pull the B-pillar trim away from the cab side panel far enough to access the speaker wire harness connector (Fig. 9).



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Fig. 9 Rear Cab Side Panel Speaker Remove/Install - Standard Cab

- 1 - B-PILLAR TRIM PANEL
- 2 - SCREW
- 3 - SPEAKER
- 4 - WIRE HARNESS CONNECTOR

(4) Disconnect the body wire harness connector from the speaker connector receptacle.

REMOVAL AND INSTALLATION (Continued)

(5) Remove the two screws that secure the speaker to the back of the B-pillar trim.

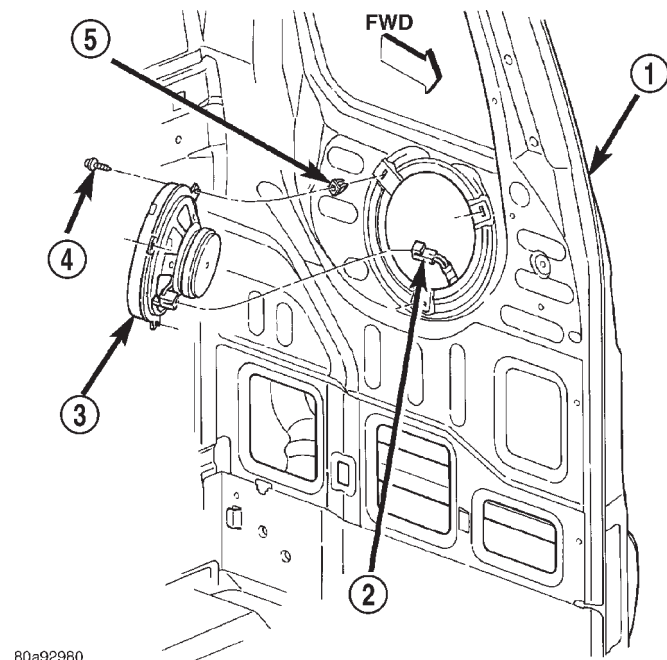
(6) Remove the speaker from the back of the B-pillar trim.

REAR CAB SIDE PANEL SPEAKER - CLUB CAB

(1) Disconnect and isolate the battery negative cable.

(2) Remove the trim panel from the rear cab side inner panel. Refer to **Quarter Trim Panel** in the Removal and Installation section of Group 23 - Body for the procedures.

(3) Remove the three screws that secure the speaker to the rear cab side inner panel (Fig. 10).



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Fig. 10 Rear Cab Side Panel Speaker Remove/Install - Club Cab

- 1 - REAR CAB SIDE
- 2 - WIRE HARNESS CONNECTOR
- 3 - SPEAKER
- 4 - SCREW
- 5 - CLIP

(4) Pull the speaker away from the mounting hole in the rear cab side inner panel far enough to access the wire harness connector.

(5) Disconnect the body wire harness connector from the speaker connector receptacle.

(6) Remove the speaker from the rear cab side inner panel.

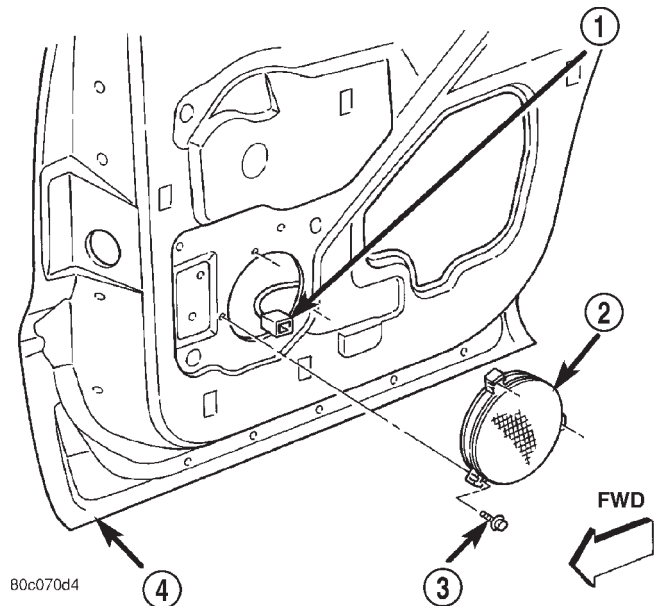
REAR DOOR SPEAKER - QUAD CAB

(1) Disconnect and isolate the battery negative cable.

(2) Remove the trim panel from the rear door. Refer to **Rear Door Trim Panel** in the Removal and

Installation section of Group 23 - Body for the procedures.

(3) Remove the three screws that secure the speaker to the rear door inner panel (Fig. 11).



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Fig. 11 Rear Door Speaker Remove/Install - Quad Cab

- 1 - CONNECTOR
- 2 - SPEAKER
- 3 - SCREW (3)
- 4 - REAR DOOR

(4) Pull the speaker away from the mounting hole in the rear door inner panel far enough to access the wire harness connector.

(5) Disconnect the rear door wire harness connector from the speaker connector receptacle.

(6) Remove the speaker from the rear door inner panel.

INSTALLATION**FRONT DOOR UPPER SPEAKER**

(1) Position the front door upper speaker to the back of the trim panel.

(2) Install and tighten the two screws that secure the front door upper speaker to the trim panel. Tighten the screws to 2 N·m (17 in. lbs.).

(3) Reconnect the door wire harness connector to the front door upper speaker wire harness connector.

(4) Install the trim panel onto the front door. Refer to **Front Door Trim Panel** in the Removal and Installation section of Group 23 - Body for the procedures.

(5) Reconnect the battery negative cable.

REMOVAL AND INSTALLATION (Continued)

FRONT DOOR LOWER SPEAKER

- (1) Position the speaker to the front door inner panel.
- (2) Reconnect the front door wire harness connector to the speaker connector receptacle.
- (3) Position the speaker into the mounting hole in the front door inner panel.
- (4) Install and tighten the three screws that secure the speaker to the front door inner panel. Tighten the screws to 2 N·m (17 in. lbs.).
- (5) Install the trim panel onto the front door. Refer to **Front Door Trim Panel** in the Removal and Installation section of Group 23 - Body for the procedures.
- (6) Reconnect the battery negative cable.

REAR CAB SIDE PANEL SPEAKER - STANDARD CAB

- (1) Position the speaker onto the back of the B-pillar trim.
- (2) Install and tighten the two screws that secure the speaker to the back of the B-pillar trim. Tighten the screws to 2 N·m (17 in. lbs.).
- (3) Reconnect the body wire harness connector to the speaker connector receptacle.
- (4) Install the trim panel onto the B-pillar. Refer to **B-Pillar Trim** in the Removal and Installation section of Group 23 - Body for the procedures.
- (5) Reconnect the battery negative cable.

REAR CAB SIDE PANEL SPEAKER - CLUB CAB

- (1) Position the speaker to the rear cab side inner panel.
- (2) Reconnect the body wire harness connector to the speaker connector receptacle.
- (3) Position the speaker into the mounting hole in the rear cab side inner panel.
- (4) Install and tighten the three screws that secure the speaker to the rear cab side inner panel. Tighten the screws to 2 N·m (17 in. lbs.).
- (5) Install the trim panel onto the rear cab side inner panel. Refer to **Quarter Trim Panel** in the Removal and Installation section of Group 23 - Body for the procedures.
- (6) Reconnect the battery negative cable.

REAR DOOR SPEAKER - QUAD CAB

- (1) Position the speaker to the rear door inner panel.
- (2) Reconnect the rear door wire harness connector to the speaker connector receptacle.
- (3) Position the speaker into the mounting hole in the rear door inner panel.
- (4) Install and tighten the three screws that secure the speaker to the rear door inner panel. Tighten the screws to 3.9 N·m (35 in. lbs.).

- (5) Install the trim panel onto the rear door. Refer to **Rear Door Trim Panel** in the Removal and Installation section of Group 23 - Body for the procedures.

- (6) Reconnect the battery negative cable.

POWER AMPLIFIER

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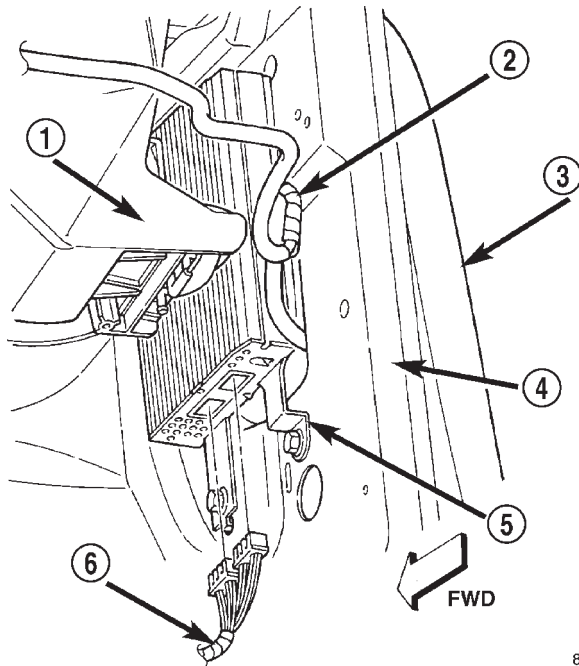
REMOVAL

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove the trim cover from the right cowl side inner panel. Refer to **Cowl Trim Cover** in the Removal and Installation section of Group 23 - Body for the procedures.
- (3) Disconnect the two instrument panel wire harness connectors from the connector receptacles on the bottom of the power amplifier (Fig. 12).
- (4) Remove the two screws that secure the power amplifier to the right cowl side inner panel (Fig. 13).
- (5) To disengage the upper hook bracket of the power amplifier from the upper hinge access hole in the right cowl side inner panel:
 - (a) Lift the power amplifier upwards about 5 centimeters (2 inches).
 - (b) Tilt the top of the power amplifier toward the instrument panel.
 - (c) Keep the top of the power amplifier tilted toward the instrument panel while lowering the unit from between the right cowl side inner panel and the end of the heater-A/C housing.
- (6) Remove the power amplifier from the right cowl side inner panel.

INSTALLATION

- (1) Position the power amplifier to the right cowl side inner panel.
- (2) To engage the upper hook bracket of the power amplifier in the upper hinge access hole in the right cowl side inner panel:
 - (a) Tilt the top of the power amplifier toward the instrument panel.
 - (b) Keep the top of the power amplifier tilted toward the instrument panel while lifting the unit up between the right cowl side inner panel and the end of the heater-A/C housing.

REMOVAL AND INSTALLATION (Continued)



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Fig. 12 Power Amplifier Connections Remove/Install

- 1 - HEATER-A/C HOUSING
- 2 - ANTENNA COAXIAL CABLE
- 3 - FENDER
- 4 - HINGE PILLAR
- 5 - AMPLIFIER
- 6 - WIRE HARNESS

(c) When the lower power amplifier mounting brackets are about 5 centimeters (2 inches) above the mounting holes for the lower brackets in the right cowl side inner panel, tilt the top of the power amplifier toward the right cowl side inner panel.

(d) Lower the power amplifier until the upper hook bracket is engaged in the upper hinge access hole in the right cowl side inner panel. Tighten the screws to 2 N·m (17 in. lbs.).

(3) Install and tighten the two screws that secure the power amplifier to the right cowl side inner panel.

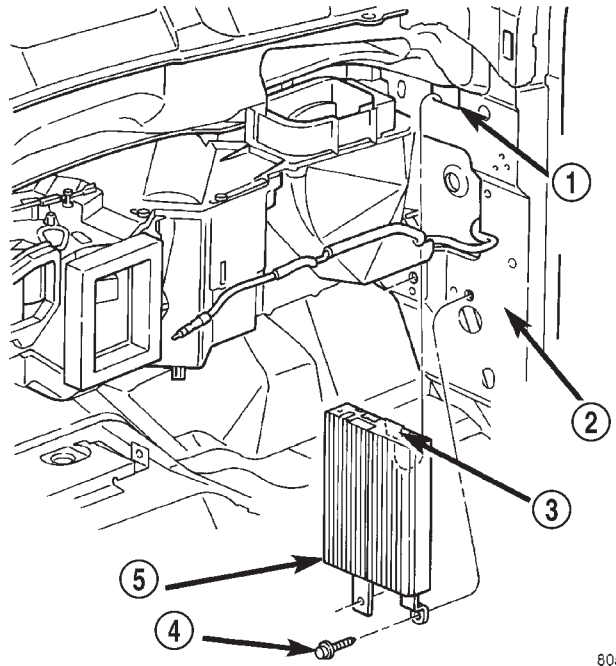
(4) Reconnect the two instrument panel wire harness connectors to the connector receptacles on the bottom of the power amplifier.

(5) Install the trim cover onto the right cowl side inner panel. Refer to **Cowl Trim Cover** in the Removal and Installation section of Group 23 - Body for the procedures.

(6) Reconnect the battery negative cable.

ANTENNA

WARNING: ON VEHICLES EQUIPPED WITH AIR-BAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY



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Fig. 13 Power Amplifier Remove/Install

- 1 - UPPER HINGE ACCESS HOLE
- 2 - COWL SIDE INNER PANEL
- 3 - HOOK
- 4 - SCREW
- 5 - AMPLIFIER

STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIR-BAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

REMOVAL**ANTENNA BODY AND CABLE**

(1) Disconnect and isolate the battery negative cable.

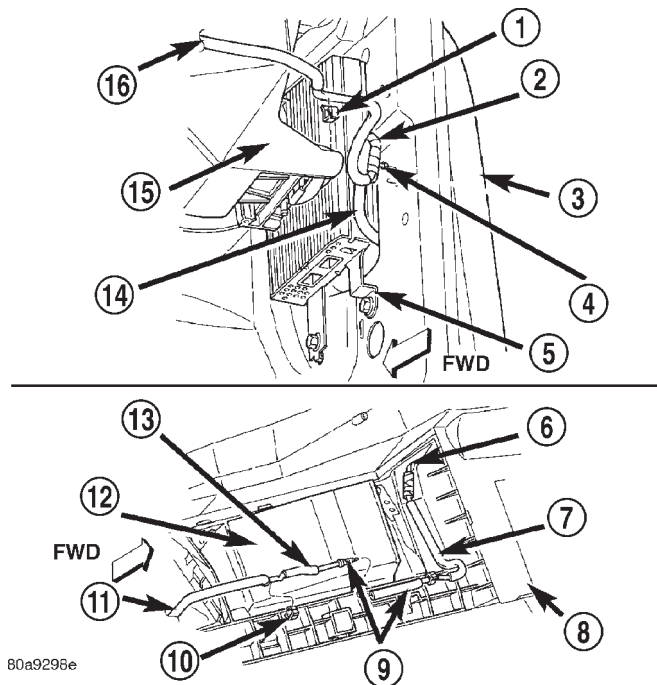
(2) Remove the trim cover from the right cowl side inner panel. Refer to **Cowl Trim Cover** in the Removal and Installation section of Group 23 - Body for the procedures.

(3) Reach under the instrument panel below the glove box to access and disconnect the antenna coaxial cable connector (Fig. 14). Disconnect the connector by pulling it apart while twisting the metal connector halves. Do not pull on the cable.

(4) Disengage the antenna coaxial cable from the retainer clips on the lower instrument panel reinforcement and the heater-A/C housing.

(5) Disengage the antenna coaxial cable retainers at the right cowl side inner panel and inside the right front fender.

REMOVAL AND INSTALLATION (Continued)

**Fig. 14 Antenna Coaxial Cable Routing**

- 1 - CLIP
- 2 - ANTENNA BODY AND CABLE
- 3 - RIGHT FRONT FENDER
- 4 - RETAINER
- 5 - AMPLIFIER
- 6 - TO RADIO
- 7 - COAXIAL CABLE
- 8 - INSTRUMENT PANEL
- 9 - CONNECTOR
- 10 - CLIP
- 11 - TO ANTENNA
- 12 - GLOVE BOX BIN
- 13 - ANTENNA BODY AND CABLE
- 14 - TO ANTENNA
- 15 - HEATER-A/C HOUSING
- 16 - TO RADIO

(6) Unscrew the antenna mast from the antenna body (Fig. 15).

(7) Remove the antenna cap nut using an antenna nut wrench (Special Tool C-4816) (Fig. 16).

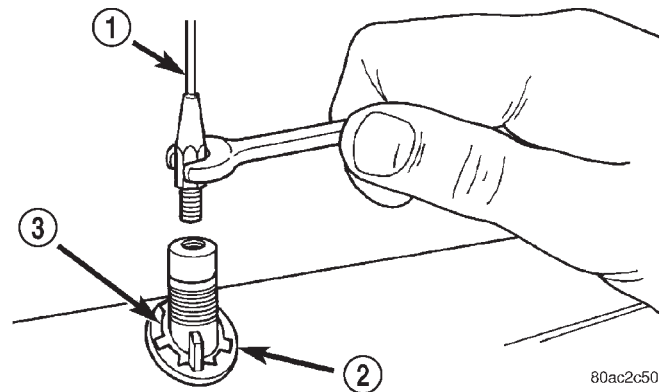
(8) Remove the antenna adapter from the top of the fender.

(9) Lower the antenna body through the mounting hole in the top of the fender.

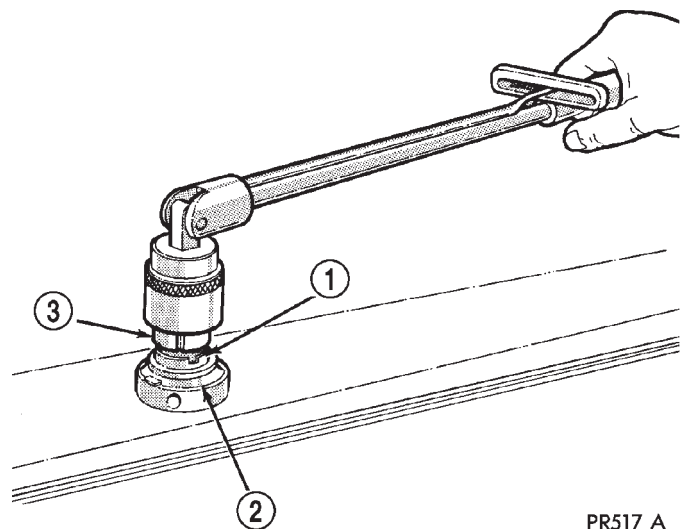
(10) Pull the antenna body and cable out through the opening between the right cowl side outer panel and the fender through the front door opening (Fig. 17).

(11) Disengage the antenna coaxial cable grommet from the hole in the right cowl side outer panel.

(12) Pull the antenna coaxial cable out of the passenger compartment through the hole in the right cowl side outer panel.

**Fig. 15 Antenna Mast Remove/Install - Typical**

- 1 - ANTENNA MAST
- 2 - ADAPTER
- 3 - CAP NUT

**Fig. 16 Antenna Cap Nut and Adapter Remove/Install - Typical**

- 1 - CAP NUT
- 2 - ANTENNA ADAPTER
- 3 - TOOL

(13) Remove the antenna body and cable from the vehicle.

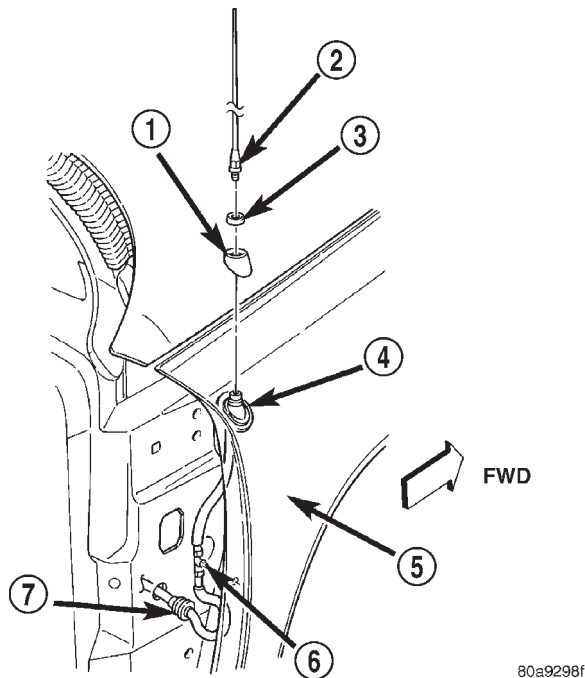
INSTRUMENT PANEL ANTENNA CABLE

(1) Disconnect and isolate the battery negative cable.

(2) Reach under the instrument panel below the glove box to access and disconnect the antenna coaxial cable connector (Fig. 14). Disconnect the connector by pulling it apart while twisting the metal connector halves. Do not pull on the cable.

(3) Securely tie a suitable length of cord or twine to the instrument panel half of the antenna coaxial cable connector. This cord will be used to pull or "fish" the cable back into position during installation.

REMOVAL AND INSTALLATION (Continued)

**Fig. 17 Antenna Mounting**

- 1 - ADAPTER
- 2 - MAST
- 3 - NUT
- 4 - ANTENNA BODY AND CABLE
- 5 - RIGHT FRONT FENDER
- 6 - RETAINER
- 7 - GROMMET

(4) Disengage the instrument panel antenna cable from the retainer clip on the lower instrument panel reinforcement inboard of the glove box opening.

(5) Roll down the glove box from the instrument panel. Refer to **Glove Box** in the Removal and Installation section of Group 8E - Instrument Panel Systems for the procedures.

(6) Reach through the glove box opening to access and disengage the retainer that secures the antenna cable to the instrument panel structural support on the inboard side of the glove box opening.

(7) Remove the radio receiver from the instrument panel. Refer to **Radio Receiver** in the Removal and Installation section of this group for the procedures.

(8) Pull the antenna cable out through the radio receiver opening in the instrument panel.

(9) Untie the cord or twine from the instrument panel antenna cable connector, leaving the cord or twine in place of the cable in the instrument panel.

(10) Remove the antenna cable from the instrument panel.

INSTALLATION**ANTENNA BODY AND CABLE**

(1) Position the antenna body and cable in the opening between the right cowl side outer panel and the fender through the front door opening.

(2) Push the antenna coaxial cable into the passenger compartment through the hole in the right cowl side outer panel.

(3) Engage the antenna coaxial cable grommet in the hole in the right cowl side outer panel.

(4) Position the antenna body through the mounting hole in the top of the fender.

(5) Install the adapter over the antenna body from the top of the fender.

(6) Install and tighten the antenna cap nut using an antenna nut wrench (Special Tool C-4816). Tighten the antenna cap nut to 8 N·m (70 in. lbs.).

(7) Install and tighten the antenna mast onto the antenna body. Tighten the mast to 3.3 N·m (30 in. lbs.).

(8) Engage the antenna coaxial cable retainers at the right cowl side inner panel and inside the right front fender.

(9) Engage the antenna coaxial cable in the retainer clips on the lower instrument panel reinforcement and the heater-A/C housing.

(10) Reach under the instrument panel below the glove box to reconnect the antenna coaxial cable connector.

(11) Install the trim cover onto the right cowl side inner panel. Refer to **Cowl Trim Cover** in the Removal and Installation section of Group 23 - Body for the procedures.

(12) Reconnect the battery negative cable.

INSTRUMENT PANEL ANTENNA CABLE

(1) Tie the end of the cord or twine that was used during instrument panel antenna cable removal securely to the connector on the end of the antenna coaxial cable being installed into the instrument panel. This cord will be used to pull or "fish" the cable back into position.

(2) Using the cord or twine, pull the antenna cable through the radio receiver opening from under the instrument panel.

(3) Install the radio receiver onto the instrument panel. Refer to **Radio Receiver** in the Removal and Installation section of this group for the procedures.

(4) Reach through the glove box opening to access and engage the retainer that secures the antenna cable to the instrument panel structural support on the inboard side of the glove box opening.

(5) Install the glove box onto the instrument panel. Refer to **Glove Box** in the Removal and Installation

REMOVAL AND INSTALLATION (Continued)

section of Group 8E - Instrument Panel Systems for the procedures.

(6) Engage the instrument panel antenna cable to the retainer clip on the lower instrument panel reinforcement inboard of the glove box opening.

(7) Untie the cord or twine from the instrument panel half of the antenna coaxial cable connector.

(8) Reach under the instrument panel below the glove box to access and reconnect the antenna coaxial cable connector.

(9) Reconnect the battery negative cable.

RADIO NOISE SUPPRESSION COMPONENTS

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REMOVAL

ENGINE-TO-BODY GROUND STRAPS

(1) Remove the nut and washer that secures the left engine-to-body ground strap eyelet terminal to the weld stud on the left side of the lower plenum panel (Fig. 18).

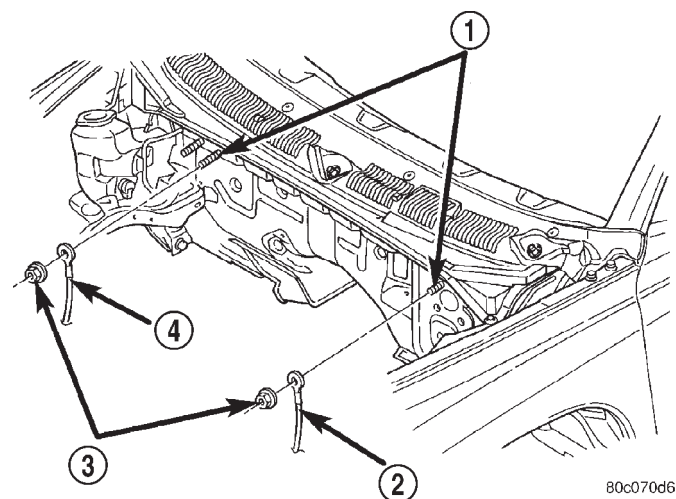


Fig. 18 Engine-To-Body Ground Strap Remove/Install - Typical

- 1 - WELD STUDS
- 2 - LEFT GROUND STRAP
- 3 - NUT AND WASHER (2)
- 4 - RIGHT GROUND STRAP

(2) On 6 and 8 cylinder engines only, remove the nut and washer that secures the right engine-to-body ground strap eyelet terminal to the inboard weld stud on the right side of the lower plenum panel (Fig. 18).

(3) On 4 cylinder engines only, remove the nut and washer that secures the left engine-to-body ground strap eyelet terminal to the stud on the left rear corner of the engine cylinder head (Fig. 19).

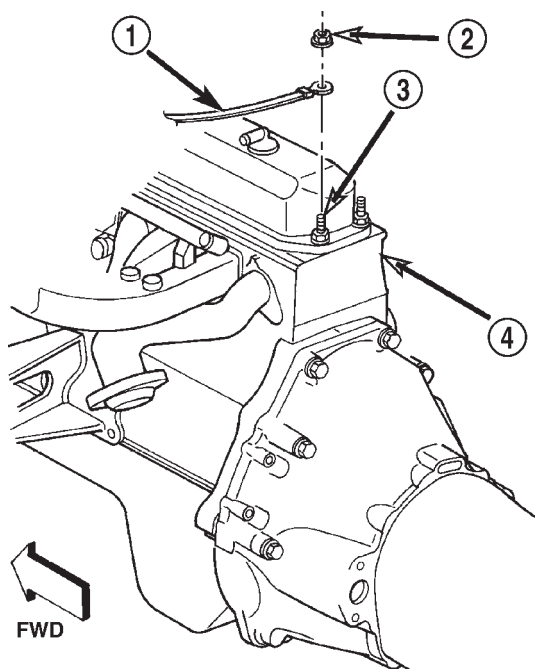


Fig. 19 Left Engine-To-Body Ground Strap Remove/Install - 4 Cylinder Engine Only

- 1 - LEFT GROUND STRAP
- 2 - NUT
- 3 - STUD
- 4 - ENGINE CYLINDER HEAD

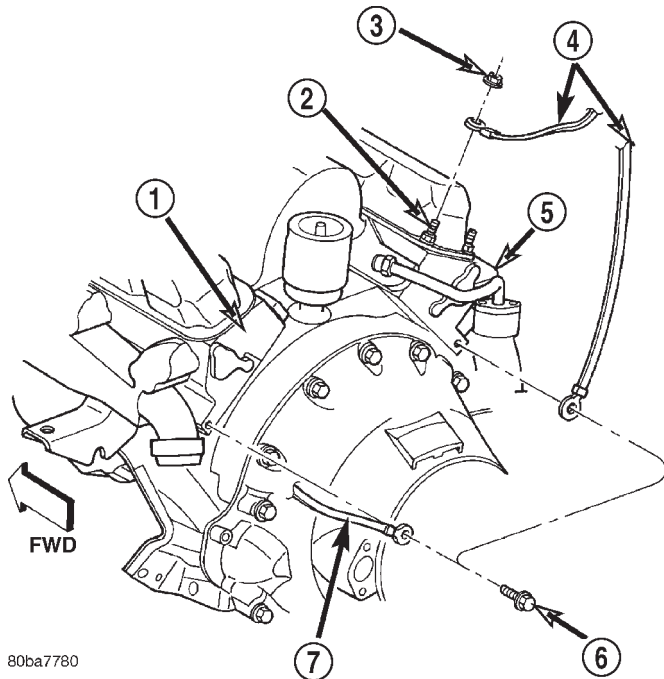
(4) On 6 and 8 cylinder engines only, remove the screw that secures the left engine-to-body ground strap eyelet terminal to the rear of the left cylinder head (Fig. 20) or (Fig. 21).

(5) On 6 and 8 cylinder engines only, remove the screw that secures the right engine-to-body ground strap eyelet terminal to the rear of the right cylinder head (Fig. 20) or (Fig. 21).

(6) On 4.7L engines only, remove the nut and washer that secures the right engine-to-body ground strap eyelet terminal and the wire harness grounds to the weld stud on the right front fender wheelhouse inner panel (Fig. 22).

(7) On 4.7L engines only, remove the screw and washer that secures the right engine-to-body ground strap eyelet terminal to the transmission at the right rear corner of the engine block (Fig. 23).

REMOVAL AND INSTALLATION (Continued)



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Fig. 20 Engine-To-Body Ground Strap Remove/Install - 3.9L & 5.9L Engine Only

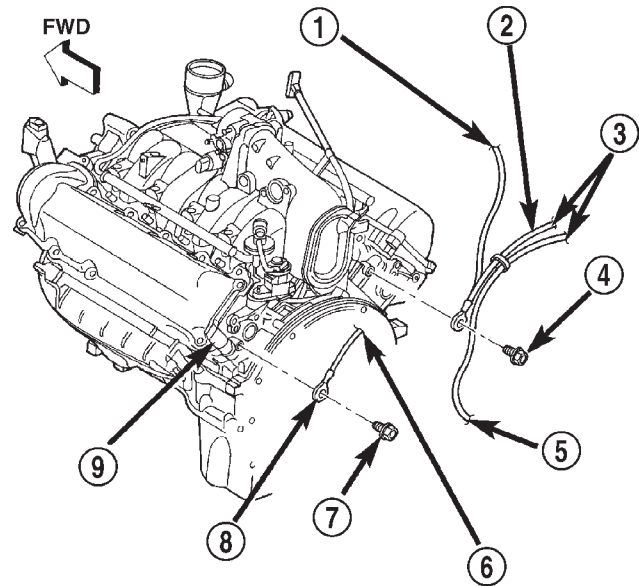
- 1 - LEFT CYLINDER HEAD
- 2 - STUD
- 3 - NUT
- 4 - RIGHT GROUND STRAP
- 5 - RIGHT CYLINDER HEAD
- 6 - SCREW (2)
- 7 - LEFT GROUND STRAP

(8) On 3.9L and 5.9L engines only, remove the nut and washer that secures the right engine-to-body ground strap eyelet terminal to the inboard rear valve cover stud of the right cylinder head (Fig. 20).

(9) Remove the engine-to-body ground strap(s) from the engine compartment.

EXHAUST SYSTEM-TO-BODY GROUND STRAP - 4.7L ENGINE ONLY

- (1) Raise and support the vehicle.
- (2) Remove the nut and washer that secures the exhaust system-to-body ground strap eyelet terminal to the exhaust pipe clamp (Fig. 24).
- (3) Remove the screw that secures the exhaust system-to-body ground strap eyelet terminal to the right body sill panel.
- (4) Disengage the clip that secures the exhaust system-to-body ground strap from the hole on the top of the right frame rail.
- (5) Remove the exhaust system-to-body ground strap from over the top of the right frame rail.



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Fig. 21 Engine-To-Body Ground Strap Remove/Install - 4.7L Engine Only

- 1 - TO RIGHT COWL STUD
- 2 - RIGHT GROUND STRAP
- 3 - TO RIGHT FENDER STUD
- 4 - SCREW
- 5 - TO TRANSMISSION
- 6 - TO LEFT COWL STUD
- 7 - SCREW
- 8 - LEFT GROUND STRAP
- 9 - LEFT CYLINDER HEAD

INSTALLATION

ENGINE-TO-BODY GROUND STRAPS

(1) Position the engine-to-body ground strap(s) in the engine compartment.

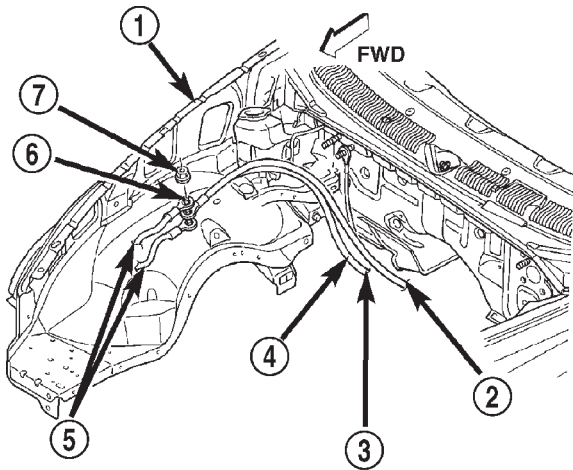
(2) On 3.9L and 5.9L engines only, position the right engine-to-body ground strap eyelet terminal over the inboard rear valve cover stud of the right cylinder head.

(3) On 3.9L and 5.9L engines only, install and tighten the nut and washer that secures the right engine-to-body ground strap eyelet terminal to the inboard rear valve cover stud of the right cylinder head. Tighten the nut to 2.8 N·m (25 in. lbs.).

(4) On 4.7L engines only, install and tighten the screw and washer that secures the right engine-to-body ground strap eyelet terminal to the transmission at the right rear corner of the engine block. Tighten the screw to 67.8 N·m (50 ft. lbs.).

(5) On 4.7L engines only, position the right engine-to-body ground strap eyelet terminal and the wire harness grounds over the weld stud on the right front fender wheelhouse inner panel.

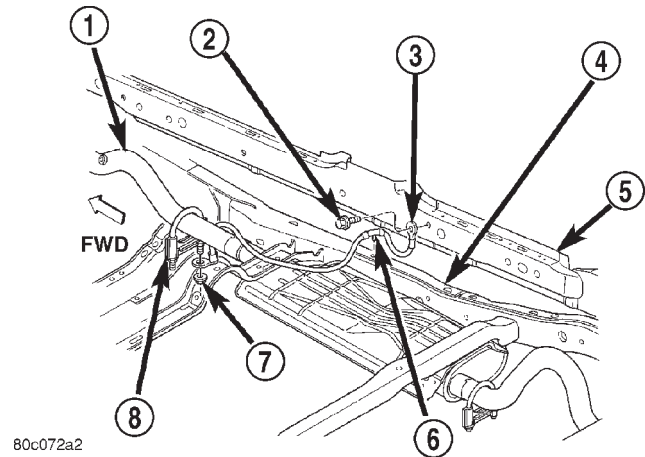
REMOVAL AND INSTALLATION (Continued)



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Fig. 22 Engine-To-Body Ground Strap Remove/Install - 4.7L Engine Only

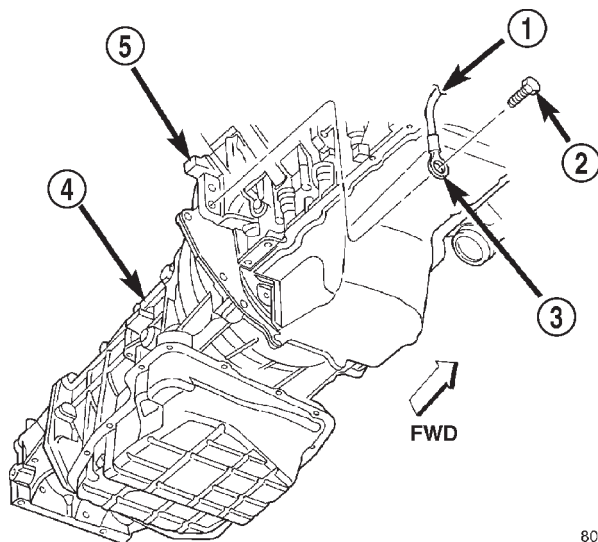
- 1 - RIGHT FRONT FENDER
- 2 - TO RIGHT CYLINDER HEAD
- 3 - TO TRANSMISSION
- 4 - RIGHT GROUND STRAP
- 5 - WIRE HARNESS GROUNDS
- 6 - WELD STUD
- 7 - NUT AND WASHER



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Fig. 24 Exhaust System-To-Body Ground Strap Remove/Install - Typical

- 1 - EXHAUST PIPE
- 2 - SCREW
- 3 - EXHAUST SYSTEM-TO-BODY GROUND STRAP
- 4 - RIGHT FRAME RAIL
- 5 - RIGHT BODY SILL PANEL
- 6 - CLIP
- 7 - NUT AND WASHER
- 8 - CLAMP



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Fig. 23 Engine-To-Body Ground Strap Remove/Install - 4.7L Engine Only

- 1 - TO RIGHT FENDER STUD
- 2 - SCREW AND WASHER
- 3 - RIGHT GROUND STRAP
- 4 - TRANSMISSION
- 5 - ENGINE BLOCK

(6) On 4.7L engines only, install and tighten the nut and washer that secures the right engine-to-body ground strap eyelet terminal and the wire harness grounds to the weld stud on the right front fender

wheelhouse inner panel. Tighten the nut to 11.8 N·m (105 in. lbs.).

(7) On 6 and 8 cylinder engines only, install and tighten the screw that secures the right engine-to-body ground strap eyelet terminal to the rear of the right cylinder head. On 3.9L and 5.9L engines, tighten the screw to 10.2 N·m (90 in. lbs.). On 4.7L engines, tighten the screw to 10.7 N·m (95 in. lbs.).

(8) On 6 and 8 cylinder engines only, install and tighten the screw that secures the left engine-to-body ground strap eyelet terminal to the rear of the left cylinder head. On 3.9L and 5.9L engines, tighten the screw to 10.2 N·m (90 in. lbs.). On 4.7L engines, tighten the screw to 10.7 N·m (95 in. lbs.).

(9) On 4 cylinder engines only, position the left engine-to-body ground strap eyelet terminal over the stud on the left rear corner of the engine cylinder head.

(10) On 4 cylinder engines only, install and tighten the nut and washer that secures the left engine-to-body ground strap eyelet terminal to the stud on the left rear corner of the engine cylinder head. Tighten the nut to 2.8 N·m (25 in. lbs.).

(11) On 6 and 8 cylinder engines only, position the right engine-to-body ground strap eyelet over the inboard weld stud on the right side of the lower plenum panel.

(12) On 6 and 8 cylinder engines only, install and tighten the nut and washer that secures the right engine-to-body ground strap eyelet to the inboard

REMOVAL AND INSTALLATION (Continued)

weld stud on the right side of the lower plenum panel. Tighten the nut to 9 N·m (80 in. lbs.).

(13) Install and tighten the nut and washer that secures the left engine-to-body ground strap eyelet to the weld stud on the left side of the lower plenum panel. Tighten the nut to 9 N·m (80 in. lbs.).

EXHAUST SYSTEM-TO-BODY GROUND STRAP - 4.7L ENGINE ONLY

(1) Position the exhaust system-to-body ground strap over the top of the right frame rail.

(2) Engage the clip that secures the exhaust system-to-body ground strap in the hole on the top of the right frame rail.

(3) Install and tighten the screw that secures the exhaust system-to-body ground strap eyelet terminal to the right body sill panel. Tighten the screw to 5.0 N·m (45 in. lbs.).

(4) Position the exhaust system-to-body ground strap eyelet terminal over the exhaust pipe clamp U-bolt.

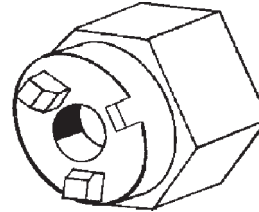
(5) Install and tighten the nut and washer that

secures the exhaust system-to-body ground strap eyelet terminal to the exhaust pipe clamp. Tighten the nut to 27.1 N·m (20 ft. lbs.).

(6) Lower the vehicle.

SPECIAL TOOLS

AUDIO SYSTEMS



Antenna Nut Wrench C-4816

